

TOWARD A THEORY OF "HYPNOTIC" BEHAVIOR: EXPERIMENTAL ANALYSES OF SUGGESTED AMNESIA¹

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Suggestions of amnesia were given to 144 Ss in a $2 \times 2 \times 4$ factorial experiment. The independent variables were: (1) spoken versus recorded presentation of suggestions; (2) presence versus absence of hypnotic induction; and (3) 4 types of suggestions for amnesia—authoritative ("You will not remember!"), permissive ("Try to forget"), suggestions to simulate, and no suggestions. Variable 1 did not produce important differences in amnesic performance. Variable 2 significantly affected 1 of the 5 tests for amnesia, with the presence of hypnotic induction resulting in less amnesia. Variable 3 exerted the most powerful effect. Irrespective of the presence or absence of hypnotic induction, Ss differed on the tests for amnesia depending on whether they were given suggestions to simulate, authoritative or permissive, or no suggestions.

Williamsen, Johnson, and Eriksen (1965) recently demonstrated that hypnotic subjects who have received suggestions of amnesia show (a) more amnesia than waking controls and (b) less amnesia than waking subjects who have been instructed to act as if they have forgotten (simulators). Since these findings indicate that hypnotic amnesia is not the same as simulated amnesia and is also not the same as normal recall, they are of critical importance in formulating a theory of hypnotic behavior. Before drawing definitive conclusions from the Williamsen et al. study, however, it is necessary to cross-validate their results. This paper presents several methodological considerations relevant to research in this area and an experiment which replicated and extended the experiment of Williamsen et al.

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METHODOLOGICAL CONSIDERATIONS

In the Williamsen et al. experiment all subjects learned six critical words. The hypnotic subjects were then given direct suggestions to forget the critical words, the waking simulators were told to act *as if* they had forgotten, and the waking controls were *not* given suggestions pertaining to amnesia. Since the direct suggestions for amnesia were confounded with the hypnotic treatment and the instructions to simulate amnesia were confounded with a waking treatment, it is not clear to what extent the differences in performance on the tests for amnesia were due to (a) the presence or absence of "hypnosis" or (b) differences in suggestions or instructions given to the three experimental groups. If a hypnotic group and a waking group had received identical suggestions for amnesia, the two groups may have manifested a comparable degree of forgetting (cf. Barber & Calverley, 1962, 1963b, 1963c). Furthermore, a hypnotic group and a waking group instructed to simulate amnesia may not have differed in performance. In addition, if a hypnotic control group had been employed, it may not have differed from the waking control group in the degree of forgetting. These considerations raise the following question that we attempted to answer in the experiment which is described below: Does a hypnotic group manifest more amnesia than a waking group when both groups are given

(a) identical suggestions of amnesia, or (b) identical instructions to simulate amnesia, or (c) neither suggestions of amnesia nor instructions to simulate amnesia?

In light of a series of recent studies, reviewed by Barber (1962a, 1965), a number of additional factors were incorporated into the design of our experiment:

1. There is evidence to indicate that experimenters find it difficult to give identically worded suggestions to hypnotic and waking subjects in the same tone of voice, and the biased tone of voice in which the suggestions are administered affects the subjects' responses (Barber & Calverley, 1964b; Troffer & Tart, 1964). To assess the effects of this variable in our experiment, half of the subjects in each experimental group were given the suggestions by means of a tape recording and the tests for amnesia by means of a written questionnaire. The remaining half were given the suggestions and tests for amnesia orally, as in the Williamsen et al. experiment.

2. Authoritative suggestions of amnesia ("You will not remember!"), as used in the Williamsen et al. experiment, may be less effective with awake subjects than with hypnotic subjects in that such peremptory suggestions may appear incongruous in the waking situation and may be unexpected by the awake subject, whereas they fit into the hypnotic situation and are expected by the hypnotic subject. It appears likely, however, that *permissive* suggestions to "try to forget" may not seem incongruous to either the awake or the hypnotic subjects. Consequently, in our experiment, in addition to a waking group and a hypnotic group told authoritatively "You will not remember," a second waking group and a second hypnotic group were told permissively, "Try to forget."

3. In the Williamsen et al. study, none of the subjects were asked, after the experiment, whether they had actually forgotten the critical words which they had not verbalized during the experiment. Instead, Williamsen et al. apparently assumed that (a) the hypnotic subjects forgot those words which they did not verbalize and (b) the simulators did not forget the critical words, even though they behaved as if they did. These implicit assumptions may or may not be valid. If postexperi-

mental interviews had been conducted, both the hypnotic and the simulating subjects might have stated that they did not forget the critical words during the experiment. Consequently, in the experiment described below, all subjects were given a "Post"-Experimental Subjective Reports questionnaire to ascertain whether their subjective testimony concerning what occurred during the experiment was in harmony with their objective behavior as it had been observed during the experiment.

METHOD

Subjects

The subjects were 144 student nurses (ages 17 to 25) who were required to participate in the experiment. Originally, 148 student nurses were directed by their supervisors to report to the experimental room at a specified time to participate in a "psychological experiment." Of these 148, one did not meet the appointment and three refused to participate when they were told, after they had entered the experimental room, that they were to be hypnotized. The remaining 144 subjects were randomly assigned to 16 experimental groups with 9 to each group.

All students were tested individually. At the end of each test session each was admonished not to discuss the experiment with the other students since the "experiment would be ruined" if subjects knew "what the experiment was about" prior to their participation. Each student stated that she understood the importance of this admonition and promised that she would not discuss the experiment with the other students until all had been tested. We found no evidence that any student broke her promise.

Design

The experiment was designed as a $2 \times 2 \times 4$ factorial. The first independent variable was at two levels: Spoken versus Recorded-Written Presentation (of instructions, suggestions, and tests for amnesia). The second independent variable was also at two levels: Presence versus Absence of Hypnotic Induction. The third independent variable, Types of Suggestions, was at four levels: authoritative suggestions of amnesia, permissive suggestions of amnesia, instructions to simulate amnesia, and no suggestions of amnesia. The $2 \times 2 \times 4$ factorial requires 16 experimental groups as illustrated in Table 1.

Procedure (Independent Variables)

Spoken versus recorded-written presentation. Half of the subjects (Groups 1-8) were given all suggestions and instructions orally as memorized by the experimenter (DSC). The questions comprising the tests for amnesia were also given to these subjects orally and the subjects answered the questions orally.

TABLE 1
EXPERIMENTAL DESIGN: $2 \times 2 \times 4$ FACTORIAL

	Spoken presentation		Recorded-Written presentation	
	Hypnotic induction	No hypnotic induction	Hypnotic induction	No hypnotic induction
Authoritative suggestions of amnesia	Group 1	Group 5	Group 9	Group 13
Permissive suggestions of amnesia	Group 2	Group 6	Group 10	Group 14
Instructions to simulate amnesia	Group 3	Group 7	Group 11	Group 15
No suggestions of amnesia	Group 4	Group 8	Group 12	Group 16

The other half of the subjects (Groups 9–16) were given all suggestions and instructions by means of a tape recording of the experimenter's voice. The questions comprising the tests for amnesia were given to these subjects in written form and the subjects answered the questions by writing. The experimenter thus did not speak to the subjects in Groups 9–16 during the experiment with the exception of four introductory remarks, namely, greeting the subject, instructing her to be seated, and asking her name and age.

Presence versus absence of hypnotic induction. As Table 1 illustrates, half of the subjects were, and half were not exposed to a hypnotic induction procedure. (It should be noted that of those exposed to the hypnotic induction, half were given the induction orally and half by means of a tape recording.)

Subjects exposed to the hypnotic induction (Groups 1–4 and 9–12) were first told that they were to be hypnotized, were asked to fixate on a light blinking in synchrony with the sound of a metronome, and were then given a standardized induction procedure, for a period of 10 minutes, which was adapted from the procedures of Friedlander and Sarbin (1938), Marcuse (1959), and Weitzenhoffer and Hilgard (1959). This hypnotic induction procedure included (a) motivational suggestions ("You will find hypnosis a most interesting experience . . . Your willingness to cooperate and your interest is what I ask for"), (b) repeated suggestions of eye-heaviness, eye-closure, relaxation, drowsiness, sleep, and of entering deep hypnosis, and (c) statements that the subject would now find it easy to respond to further suggestions and to experience suggested effects.² Immediately upon completing the induction procedure, the subjects were assessed on response to the first six test suggestions included in the Barber Suggestibility Scale (BSS; Barber &

Calverley, 1963a; Barber & Glass, 1962; Barber, Karacan, & Calverley, 1964). These test suggestions were: arm lowering; arm levitation; hand lock (inability to unclasp one's hands); thirst "hallucination"; verbal inhibition (inability to speak one's name); and body immobility. Immediately after the six test suggestions were administered and scored, the subject was given six critical words to learn as described below.

Subjects not exposed to the hypnotic induction (Groups 5–8 and 13–16) were simply told that they were to be given a test, were asked to listen carefully to the instructions, and then were given the six critical words to learn. In contrast to the subjects in the hypnotic groups, the waking subjects in Groups 5–8 and 13–16 had their eyes open continuously during the experiment.

Presentation of six critical words. The six critical words were presented as follows:

I want you to listen carefully to the following words. After the whole list is read to you I want you to repeat them to make sure you have learned them. I'll say the words now, after which you will repeat them: BUTTER, DARK, SOFT, KING, SLOW, COLD. Now repeat them. (Pause) I'll say them again: BUTTER, DARK, SOFT, KING, SLOW, COLD. Now repeat them.

Of the 144 subjects, 106 (74%) had learned the six critical words, that is, repeated them correctly, after the second presentation. The 38 subjects who had not learned the words after the second presentation were given a third, and when necessary, a fourth and fifth presentation, until they too repeated them correctly. (Groups 9–16 were given all presentations by a tape recording and Groups 1–8 were given all presentations orally.)

Types of suggestions. After the subject had learned the six critical words, she was given one of four types of suggestions, as follows:

1. Authoritative suggestions of amnesia—Two groups that had received a hypnotic induction (Groups 1 and 9) and two groups that had not received an induction (Groups 5 and 13) were given authoritative suggestions of amnesia for the six critical words, as follows:

Now I want you to listen carefully to what I say. I just gave you a list of words to learn. You

² A verbatim account of the hypnotic induction procedure may be obtained without charge from Theodore Xenophon Barber, Medfield Foundation, Harding, Massachusetts, or for a fee from the American Documentation Institute. Order Document No. 8320 from ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington, D. C. 20540. Remit in advance \$1.25 for microfilm or \$1.25 for photocopies and make checks payable to: Chief, Photoduplication Service, Library of Congress.

will not be able to remember what the words were! You will have no memory that you were given any words to learn in this experiment or what the words were. You will forget that you learned any words in this experiment until it is stated that the experiment is over. When it is stated that the experiment is over you will be able to remember everything. Now you will forget each of the words completely and you will forget that you were given any words to learn in this experiment until it is stated that the experiment is over.

2. Permissive suggestions of amnesia—Two groups that had received a hypnotic induction (Groups 2 and 10) and two groups that had not (Groups 6 and 14) were told that it was easy to forget and were instructed permissively to try to forget the six critical words, as follows:

I'm going to test your ability to control your memory by determining how well you are able to forget something I will tell you to forget. You may have easily forgotten which shoe you put on first this morning or what you read in the newspaper yesterday. We've asked people if they remembered what they read 1 or 2 days ago and the great majority couldn't remember off hand. I often find it very hard to remember what I read in the newspaper or in a novel just a few minutes after I've read it. It really is easy to forget some things.

Now I want you to listen carefully to what I say. I just gave you a list of words to learn. In this next part of the experiment I want you to show me how good you are at controlling your memory by forgetting that you were given any words to learn in this experiment or what the words were. Forget that you learned any words in this experiment until it is stated that the experiment is over. When it is stated that the experiment is over you will be able to remember everything. This can be done. Other subjects that participated in this experiment did very well in this test. They were able to put the words out of their mind and to forget them. Now try to the best of your ability to forget each of the words completely and to forget that you were given any words to learn in this experiment until it is stated that the experiment is over.

3. Instructions to simulate amnesia—Two groups that had received a hypnotic induction (Groups 3 and 11) and two groups that had not received an induction (Groups 7 and 15) were instructed to simulate amnesia, as follows:

This experiment is designed to measure how well people can simulate or fake posthypnotic amnesia. I want to see how well you can play the role of a hypnotized subject. Now what I want you to do is to act as if you have been deeply hypnotized and given the suggestion that you do not remember that you were given any words to learn in this experiment and that you do not

remember any of the words. I want you to act as if you had been told that you would have no memory of having learned any words in this experiment. Act as if you do not remember the words until it is stated that the experiment is over. After it is stated that the experiment is over you will no longer have to act and can tell me the words you just learned. I know you can do a good job. Here is a chance to see how good an actress you are. It's not as hard as you think. Now act as if you have forgotten each of the words. Act as if you have forgotten that you received any words in this experiment. Act as if you have forgotten until it is stated that the experiment is over.

4. No suggestions of amnesia—Two hypnotic groups (Groups 4 and 12) and two waking groups (Groups 8 and 16) were not given any suggestions pertaining to amnesia for the words they had learned.

Assessment of Amnesia (Dependent Variables)

Upon completing the above, the experimenter (DSC) assessed the subject's response to the suggestions for amnesia. Amnesia was assessed by four tests which were originally constructed by Williamsen et al. (Experimental Recall, Recognition of Partial Words, Recognition of Whole Words, and "Post"-Experimental Recall) and by one test devised by us ("Post"-Experimental Subjective Reports).³ Half of the subjects (Groups 1-8) were given the tests for amnesia orally by the experimenter; the others (Groups 9-16) were given the same tests in written form (on a six-page dittoed questionnaire) as follows

Experimental Recall. Page 1 of the questionnaire stated: "Were you given any words to learn in this experiment? No——. Yes——."

Page 2 stated, "If you did learn some words in this experiment, recall as many of the words as you can and write them below."

If the subject answered "No" on page 1, she was not given page 2.

If the answer to page 1 was "No," the subject received a score of zero on this test. If the answer to page 1 was "Yes," the score was the number of critical words correctly recalled on page 2.

Recognition of Partial Words. Page 3 of the questionnaire stated: "You will be shown words that have parts of their letters missing. You are to try to guess what the words are and write them below." The subject was then presented with 12 words that had parts of their letters missing (modeled after the Street Gestalt figures). These partial words were presented one at a time on 3 × 5 index cards. The maximum time of presentation of each partial word was 30 seconds. The 12 partial words included the 6 critical words and 6 neutral (control) words. As

³ Williamsen et al. also used a word association test. Since their experimental groups did not differ on this test, we did not use it in our experiment.

in the Williamsen et al. experiment, the neutral words were: LONG, TABLE, SOUR, WOMAN, WATER, HIGH. Pretesting of several alternate forms resulted in the selection of 12 partial words that evoked the correct response about 25% of the time from a group of pilot subjects. Prior to the beginning of the experiment the order of presentation of the partial words was randomized and this order was held constant for all subjects.

The critical and neutral partial words were scored separately. One point was allotted for each critical word recognized and one point was allotted for each neutral word recognized. Thus the maximum score for recognition of either the critical or neutral words was six points.

Recognition of Whole Words. Page 4 of the questionnaire was worded thus:

If you had learned any words in this experiment; are there any words below which are words you could have learned? If so, place a check beside the word. SOAP—; BOOK—; SOFT—; PARK—; HIGH—; SLOW—; WATER—; DARK—; QUEEN—; SOUR—; COLD—; LONG—; BUTTER—; WOMAN—; KING—; TABLE—; ROBE—; COOK—.

The words included in this recognition test were the six critical words, the six neutral words that had been used in the preceding Recognition of Partial Words test, and six "dummy" words, listed in random order. One point was allotted for each of the critical words checked.

"Post"-Experimental Recall. Page 5 of the questionnaire stated: "The experiment is over. Now that the experiment is over give as many of the words you were asked to learn at the beginning of this experiment as you can remember. Write them below." One point was given for each of the six critical words correctly recalled.

"Post"-Experimental Subjective Reports. The final page of the questionnaire was given only to those subjects who had manifested some degree of apparent amnesia on the tests of recall, that is, who recalled fewer words on Experimental Recall than on "Post"-Experimental Recall. This page was worded thus:

When it was stated on the immediately preceding page that "the experiment is over" you recalled — more words than you did at the beginning of the experiment. Apparently you forgot these — words. [The preceding blank spaces were filled in by the experimenter.] People forget in various ways. Please check which one of the following applies to you:

A—. I forgot the words in that I did not think about them at all and they did not enter my mind until the end of the experiment.

B—. I forgot the words only partially in that I thought of them at certain times, off and on, during the experiment.

C—. I did not forget the words. I knew them or was thinking of them during the experiment.

TABLE 2

MEAN SCORES OF THREE GROUPS ON EXPERIMENTAL AND "POST"-EXPERIMENTAL RECALL AND RECOGNITION OF PARTIAL AND WHOLE WORDS IN PRESENT INVESTIGATION (WITHOUT PARENTHESES) AND IN WILLIAMSEN ET AL. INVESTIGATION (IN PARENTHESES)

	Hypnotic amnesia	Simula- tion	Con- trol
(a) Experimental recall			
High susceptible	1.5 (1.3)		
Low susceptible	5.4 (3.8)		
Average	3.7 _b (2.6 _b)	0.0 _c (0.0 _c)	5.7 _a (5.4 _a)
Post-experimental re- call			
High susceptible	5.2 (4.6)		
Low susceptible	5.2 (4.8)		
Average	5.2 _a (4.7 _a)	5.2 _a (4.8 _a)	5.4 _a (5.5 _a)
(b) Partial words			
Critical words	4.1 _a (3.4 _a)	2.3 _b (1.6 _b)	3.8 _a (4.2 _a)
Neutral words	1.8 _a (1.1 _a)	1.3 _a (1.6 _a)	0.7 _a (1.1 _a)
(c) Whole words			
High susceptible	3.0 (2.9)		
Low susceptible	5.4 (5.1)		
Average	4.3 _a (4.0 _a)	1.6 _b (0.0 _b)	5.0 _a (5.5 _a)

Note.—Means in the same row containing different letters in the subscript differ from each other at the .05 level of confidence.

Items A, B, and C received weights of 2, 1, and 0, respectively. Subjective scores were derived by multiplying the number of words the subject had ostensibly forgotten (the difference between the scores on "Post"-Experimental and Experimental Recall) either by 2 (if she checked Item A), or by 1 (if she checked Item B), or by 0 (if she checked Item C). (Subjects who had not manifested amnesia, that is, who gave as many words on Experimental Recall as on "Post"-Experimental Recall, were not given the "Post"-Experimental Subjective Reports questionnaire and were automatically assigned a subjective score of zero.)

RESULTS

Replication of Williamsen et al. Experiment

Three of the 16 groups in our experiment (Groups 1, 7, and 8) were treated in essentially the same way as the three groups used by Williamsen et al. Specifically, both experiments included a hypnotic amnesia group, a waking simulation group, and a waking con-

trol group that received all instructions and suggestions orally and were assessed orally on Experimental and "Post"-Experimental Recall and on Recognition of Partial and Whole Words. To ascertain whether we had cross-validated the findings of Williamsen et al. we first compared the results we had obtained with our Groups 1, 7, and 8 with the results they had obtained (see Table 2).

Experimental and "Post-Experimental Recall (Table 2a). In both the Williamsen et al. experiment and our experiment, the scores on the recall tests were treated by analyses of variance and multiple comparisons were made among the three treatment means. These analyses yielded the following results:

1. With respect to Experimental Recall, in both experiments the simulators recalled none

TABLE 3
MEAN SCORES ON TESTS FOR AMNESIA

	1 Experimental recall	2 Recognition of partial words		3 Recognition of whole words	4 "Post"- Experimental recall	5 "Post"- Experimental subjective reports
		Critical words	Neutral words			
Spoken presentation (Groups 1-8)	3.9	3.8	1.2	4.2	5.1	1.8
Recorded-Written presentation (Groups 9-16)	3.4	3.6	1.5	4.2	5.4	1.2
Hypnotic induction (Groups 1-4 and 9-12)	4.0	3.9	1.4	4.2	5.3	1.1
No hypnotic induction (Groups 5-8 and 13-16)	3.2	3.5	1.3	4.2	5.2	1.8
Authoritative suggestions of amnesia, with hypnotic induction (Groups 1 and 9)	4.4	3.7	1.2	4.3	5.2	1.0
Authoritative suggestions of amnesia, without hypnotic induction (Groups 5 and 13)	3.5	4.3	1.6	4.7	5.4	2.0
Authoritative suggestions of amnesia, with and without hypnotic induction (Groups 1, 5, 9, and 13)	4.0	4.0	1.4	4.5	5.3	1.5
Permissive suggestions of amnesia, with hypnotic induction (Groups 2 and 10)	5.0	4.3	1.6	5.4	5.2	0.5
Permissive suggestions of amnesia, without hypnotic induction (Groups 6 and 14)	2.6	3.4	1.4	4.0	5.0	2.9
Permissive suggestion of amnesia, with and without hypnotic induction (Groups 2, 6, 10, and 14)	3.8	3.9	1.5	4.7	5.1	1.7
Instructions to simulate amnesia, with hypnotic induction (Groups 3 and 11)	1.3	3.3	1.5	1.8	5.2	2.4
Instructions to simulate amnesia, without hypnotic induction (Groups 7 and 15)	1.1	2.3	1.0	2.9	5.0	2.3
Instructions to simulate amnesia, with and without hypnotic induction (Groups 3, 7, 11, and 15)	1.2	2.8	1.2	2.4	5.1	2.4
No suggestions of amnesia, with hypnotic induction (Groups 4 and 12)	5.4	4.2	1.3	5.4	5.4	0.6
No suggestions of amnesia, without hypnotic induction (Groups 8 and 16)	5.8	4.2	1.1	5.1	5.5	0.0
No suggestions of amnesia, with and without hypnotic induction (Groups 4, 8, 12, and 16)	5.6	4.2	1.2	5.2	5.4	0.3

TABLE 4
2 × 2 × 4 ANALYSES OF VARIANCE OF SCORES ON TESTS FOR AMNESIA

Source	df	1 Experimental recall		2 Recognition of partial words				3 Recognition of whole words		4 "Post"- Experimental Recall		5 "Post"- Experimental subjective reports	
		MS	F	Critical words		Neutral words		MS	F	MS	F	MS	F
				MS	F	MS	F						
Spoken versus recorded-written presentation (A)	1	9.50	2.36	1.00		4.00	2.20	.17		1.18	1.90	12.84	2.30
Presence versus absence of hypnotic induction (B)	1	22.56	5.61*	4.69	1.66	.69		.17		.01		16.67	2.99
Types of suggestions (C)	3	123.00	30.60**	13.31	4.72*	.50		55.91	14.26**	1.15	1.85	25.99	4.67**
A × B	1	3.68		.25		3.36	1.85	.34		.56		.01	
A × C	3	6.42	1.60	1.16		2.05	1.13	9.02	2.30	.78	1.26	18.36	3.30*
B × C	3	12.88	3.20*	5.04	1.79	1.08		10.10	2.58	.32		16.52	2.96*
A × B × C	3	5.95	1.48	2.30		.56		7.49	1.91	.54		3.89	
Error	128	4.02		2.82		1.82		3.92		.62		5.57	

* $p < .05$.

** $p < .01$.

of the six critical words, the controls recalled practically all of the words, and the hypnotic group recalled significantly more words than the simulators and significantly fewer words than the controls.⁴ Further, in both experiments the high susceptible hypnotic subjects recalled significantly fewer words than the low susceptible.⁵

2. With respect to "Post"-Experimental Recall, there were no significant differences in either our experiment or in the Williamsen et al. experiment between the hypnotic, simulating, and control groups, or between the high and low susceptible hypnotic subjects. In both experiments all groups "post"-experimentally recalled almost all (about five) of the six critical words.

Recognition of Partial Words (Table 2b). In both experiments, the simulators recog-

nized significantly fewer of the *critical* words (when they were presented as partial words) than the hypnotic group and the controls. The latter two groups did not differ significantly from each other.

In both experiments, the three experimental groups did not differ significantly in recognition of the *neutral* (control) partial words.

In both experiments, the hypnotic and control groups (but not the simulators) recognized significantly more critical than neutral partial words.⁶

Recognition of Whole Words (Table 2c). In both experiments, the simulators recognized very few or none of the critical words (presented as whole words), the controls and the low susceptible hypnotic subjects recognized practically all of the words, and the high susceptible hypnotic subjects recognized significantly more words than the simula-

⁴ The .05 level of confidence is used as the criterion for significance in this and all other statistical analyses discussed in the present report.

⁵ In the Williamsen et al. experiment, high and low susceptible refer, respectively, to subjects scoring 8 or higher and 4 or below on the 12-point Stanford Hypnotic Susceptibility Scale (Weitzenhoffer & Hilgard, 1959). In our experiment, high and low susceptible refer, respectively, to subjects passing 5 or more and less than 5 test-suggestions on the abbreviated 6-point Barber Suggestibility Scale.

⁶ Latency of response, that is, the number of seconds required by the subject to recognize each word, was also measured. In both our experiment and in the Williamsen et al. experiment, the hypnotic and control groups recognized the critical words more quickly than the neutral words. The simulators did not show this reduction in response latency with respect to the critical words.

tors and significantly fewer words than the controls.

The results obtained in our experiment with Groups 1, 7, and 8 clearly cross-validate the results of the Williamsen et al. experiment. Although our results are practically identical to those of Williamsen et al., we cannot accept their implied conclusion that the presence or absence of "hypnotic trance induction" was an important variable in producing these effects. The results obtained with the additional 13 groups participating in our experiment strongly suggest a quite different interpretation, as indicated by the presentation that follows.

Overall Analyses of Results ($2 \times 2 \times 4$ Factorial)

The mean scores on each of the five dependent variables—Experimental Recall, Recognition of (Critical and Neutral) Partial Words, Recognition of Whole Words, "Post"-Experimental Recall, and "Post"-Experimental Subjective Reports—are presented in Table 3. These scores were treated by $2 \times 2 \times 4$ analyses of variance and Duncan (1955) Range tests, which were used to make multiple comparisons among the means. The variance analyses, presented in Table 4, showed the following results with respect to each dependent variable.

Experimental Recall (Table 4, Column 1). The main effects of Presence versus Absence of Hypnotic Induction and Types of Suggestions were significant and the interaction between these variables was also significant. Further specification of these significant effects showed the following (see Table 3, also):

1. The significant effect of Presence versus Absence of Hypnotic Induction, interpreted in the light of the interaction between this variable and Types of Suggestions, indicated that the subjects who received the hypnotic induction procedure (hypnotic groups) and those who did not (waking groups) did not differ significantly (on Experimental Recall) when they received authoritative suggestions of amnesia, instructions to simulate amnesia, and no suggestions of amnesia. However, when permissive suggestions of amnesia were administered, the hypnotic groups showed

less amnesia (verbalized more of the critical words) than the waking groups.

2. Overall, the simulating groups verbalized significantly fewer critical words than the groups given authoritative, permissive, or no suggestions of amnesia (controls). The groups given authoritative and permissive suggestions did not differ significantly from each other, and both of these groups verbalized significantly fewer words than the controls.

Recognition of (Critical and Neutral) Partial Words and Recognition of Whole Words (Table 4, Columns 2 and 3). The main effect of Types of Suggestions was significant with respect to recognition of the critical words both as partial words and as whole words. (The other main effects and interactions were nonsignificant.) Further delineation of the significant effect showed that the simulators recognized significantly fewer of the critical words than the groups given authoritative, permissive, or no suggestions of amnesia. The latter three groups did not differ significantly from each other.

With respect to recognition of neutral partial words, there were no significant main effects or interactions. All groups, irrespective of experimental treatments, recognized one to one and a half of the neutral words (see Table 3, Column 2).

All groups (simulators, controls, and groups given permissive and authoritative suggestions) recognized significantly more of the critical words than of the neutral words.⁷

"Post"-Experimental Recall. The variance analysis showed no significant main effects or interactions on "Post"-Experimental Recall (Table 4, Column 4). When told that the experiment was "over," all groups verbalized five to five and a half of the six words (see Table 3, Column 4).

"Post"-Experimental Subjective Reports—Subjective Scores (Table 4, Column 5).

⁷ In the preceding section, in which we compared our results with the results of Williamsen et al., we stated that the simulating group which entered into the comparison ((Group 7) did not recognize significantly more critical words than neutral words. In the present analysis all four groups receiving one type of suggestion are combined. The combined simulating groups (Groups 3, 7, 11, and 15) recognized significantly more critical than neutral words.

There was a significant main effect for Types of Suggestions and also significant interactions of this variable with Spoken versus Recorded-Written Presentation and with Presence versus Absence of Hypnotic Induction.

The significant main effect of Types of Suggestions indicated that subjects in the control groups (no suggestions of amnesia) testified "post"-experimentally that they had forgotten significantly fewer words than subjects in the groups given authoritative, permissive, or simulation suggestions. The latter three groups did not differ significantly from each other.

The significant interaction of Types of Suggestions with Spoken versus Recorded-Written Presentation reflected the following. The simulators and the subjects given authoritative suggestions obtained significantly higher Subjective scores under the Spoken rather than under the Recorded-Written presentation. However, the Spoken and Recorded-Written presentations did not produce differences in subjective scores when permissive suggestions and no suggestions were administered.

The nature of the significant interaction of Types of Suggestions with Presence versus Absence of Hypnotic Induction can be discerned from Table 5 which presents the results of the Duncan Range tests. This table shows that hypnotic and waking subjects did not differ significantly from each other in subjective scores when given authoritative, simulation, or no suggestions of amnesia. However, when permissive suggestions ("Try to forget") were administered to hypnotic and waking subjects, the waking subjects rather than the hypnotic subjects obtained signifi-

cantly higher subjective scores; that is, they claimed "post"-experimentally that they had experienced more amnesia.

Table 5 also shows the following: (a) the smallest subjective scores were obtained by the hypnotic groups given permissive and authoritative suggestions and by the hypnotic and waking control groups; (b) the highest subjective scores were obtained by the waking groups given permissive and authoritative suggestions and by the waking and hypnotic simulators.

The mean scores presented in Table 5 do not clarify an important question: of those subjects who ostensibly "forgot" more than one or two words during the experiment, what proportion testified "post"-experimentally that they had actually forgotten them? To answer this question, Table 6 presents the number and percentage of subjects in the various experimental groups who (a) "forgot" three or more of the six critical words on the Experimental Recall test, (b) verbalized the "forgotten" words on the "Post"-Experimental Recall test, and then (c) testified ("Post"-Experimental Subjective Reports) that they had forgotten the words either "completely" or "partially." The upper part of the table shows that very few subjects (0% to 11%) in any of the experimental groups claimed "complete" amnesia for three or more words. The bottom part of the table shows that, with the exception of one group, the majority of subjects in each of the experimental groupings did *not* claim either "complete" or "partial" amnesia. The exception here was the waking groups given permissive suggestions of whom half claimed either "complete" or "partial" amnesia.

"Good"- "Poor" Hypnotic Subjects and

TABLE 5
RESULTS OF DUNCAN RANGE TESTS APPLIED TO MEAN SUBJECTIVE SCORES

	Groups							
	Authoritative suggestions		Permissive suggestions		Instructions to simulate		No suggestions	
	1 & 9	5 & 13	2 & 10	6 & 14	3 & 11	7 & 15	4 & 12	8 & 16
Hypnotic induction	1.0 _{bcd}	—	0.5 _{cd}	—	2.4 _{ab}	—	0.6 _{cd}	—
No hypnotic induction	—	2.0 _{abc}	—	2.9 _a	—	2.3 _{ab}	—	0.0 _{cd}

Note.—Means containing a common subscript do not differ from each other at the .05 level of confidence by Duncan Range test.

TABLE 6

NUMBER (AND PERCENTAGE) OF SUBJECTS TESTIFYING "POST"-EXPERIMENTALLY THAT THEY HAD FORGOTTEN THREE OR MORE WORDS EITHER "COMPLETELY" OR "PARTIALLY"

	Authoritative suggestions	Permissive suggestions	Instructions to simulate	No suggestions
"Complete" amnesia				
Hypnotic induction	0 (0%)	0 (0%)	1 (5.5%)	1 (5.5%)
No hypnotic induction	1 (5.5%)	1 (5.5%)	2 (11.1%)	0 (0%)
Either "complete" or "partial" amnesia				
Hypnotic induction	3 (16.7%)	1 (5.5%)	8 (44.4%)	1 (5.5%)
No hypnotic induction	5 (27.7%)	9 (50.0%)	6 (33.3%)	0 (0%)

Note.— $N = 18$ in each cell.

Response to Suggestions of Amnesia. Of the 72 subjects tested under the hypnotic induction condition, 24 (33%) were rated as "excellent" hypnotic subjects (passing all six of the test suggestions on the abbreviated BSS), 8 (11%) were rated as "good" hypnotic subjects (passing five of the six test suggestions), 21 (29%) were rated as "fair" (passing three or four), and 19 (26%) were rated as "poor" (passing two or less). To ascertain whether the "better" hypnotic subjects were the most responsive to suggestions of amnesia, Pearsonian correlations were computed between (a) scores on the BSS and scores on the Experimental Recall test and (b) scores on the BSS and subjective scores (scores on the "Post"-Experimental Subjective Reports test).

The correlations are presented in Table 7. Inspection of the table shows that, with respect to hypnotic subjects given authoritative suggestions of amnesia, the higher their scores on the BSS the more they manifested amnesia, that is, the fewer the number of words they verbalized on the Experimental Recall test and the more they claimed "post"-experimentally to have experienced "complete" or "partial" amnesia. The correlations with respect to the hypnotic subjects given permissive suggestions of amnesia are in the same direction but fail to reach significance ($p < .10$, one-tailed test). The correlations for the simulators and the controls are far from significant.

DISCUSSION

Of the three independent variables in this experiment, two of these, Spoken versus Recorded-Written Presentation and Presence versus Absence of Hypnotic Induction, did not yield very powerful effects, whereas the third, Types of Suggestions, was a highly

potent variable. The effects of each of these independent variables will be discussed in turn.

Spoken versus Recorded-Written Presentation

Overall, there were no significant differences in response to the tests for amnesia between (a) the groups receiving all suggestions, instructions, and tests for amnesia orally and (b) the groups receiving the same suggestions and instructions by means of a tape recording and the tests for amnesia by means of a written questionnaire. This overall nonsignificant main effect is in line with a previous study (Barber & Calverley, 1964a) which similarly failed to find differences in response to test suggestions when the suggestions were given orally and by means of a recording.

The overall finding, however, requires a qualification with respect to one of the five dependent variables ("Post"-Experimental Subjective Reports). The Spoken presentation was more effective than the Recorded-Written presentation in producing high subjective scores in the simulators and in the groups given authoritative suggestions but not in the controls or in the groups given permissive suggestions. Further careful studies are needed to cross-validate this interaction and to clarify its significance.

Presence versus Absence of Hypnotic Induction

With one exception, subjects receiving a hypnotic induction (hypnotic groups) and those not receiving an induction (waking groups) did not differ in amnesic performance, as follows:

1. Hypnotic controls and waking controls did not differ significantly in response to any of the tests for amnesia. This outcome is

consistent with a series of recent experiments (Barber, 1958, 1962b, 1965) which indicate that very few if any hypnotic subjects forget the experimental events when amnesia is not directly or tacitly suggested.

2. Hypnotic simulators did not differ from waking simulators in response to any of the tests for amnesia. This outcome cannot be compared with that of other studies; in no previous study known to us were instructions to simulate amnesia given to both hypnotic and waking groups.

3. Hypnotic and waking subjects who received authoritative suggestions ("You will not remember!") did not differ significantly in response to any of the tests for amnesia. This outcome is in line with a series of previous experiments (Barber & Calverley, 1962, 1963b, 1963c; Barber & Glass, 1962) which failed to find significant differences between hypnotic and waking subjects in response to peremptory suggestions that they would forget one of the experimental events.

4. When permissive suggestions ("Try to forget") were administered, the hypnotic groups showed *less* amnesia than the waking groups (verbalizing more critical words on Experimental recall and obtaining smaller subjective scores). This surprising outcome requires cross-validation. If this finding is confirmed in replicative studies, it may be possible to relate it to previous investigations which indicated that *some* types of permissive suggestions—for example, permissive suggestions of deafness ("Try not to hear"), permissive suggestions for enhanced endurance ("Try your best to hold the weight for a much longer time than you did before"), permissive suggestions of analgesia ("Try to imagine that the [pain-producing] stimulus is pleasant"; Barber & Calverley, 1964c, 1964d; Barber & Hahn, 1962)—are remarkably effective with waking subjects.

Types of Suggestions

The most potent independent variable in the present experiment was Types of Suggestions. Hypnotic and waking groups given no suggestions (controls) did not show amnesia. In contrast, hypnotic and waking groups given authoritative or simulation suggestions and waking groups given permissive suggestions showed some apparent amnesia on Experimental Recall and "Post"-Experimental

Subjective Reports. In addition, the hypnotic and waking simulators also showed some apparent amnesia on Recognition of Partial and Whole Words.

The most surprising outcome of the present experiment was that, in general, apparent amnesia could be produced most effectively by administering simulation instructions to waking and hypnotic subjects and permissive suggestions to waking subjects. These groups tended to manifest more amnesia than the hypnotic groups given permissive suggestions and the hypnotic and waking groups given authoritative suggestions (see Table 3, Columns 1 and 5).

We had assumed that subjects asked to simulate amnesia would state post-experimentally that they did not forget. The present data sharply contradict this assumption. A substantial proportion (33% to 44%) of hypnotic and waking subjects who had been asked to simulate amnesia testified post-experimentally, when they were no longer simulating, that they had "completely" or "partially" forgotten at least three of the six critical words (see Table 6). This outcome does not contradict any previous studies known to us. We found no prior studies in which subjects were instructed to simulate amnesia and then were asked postexperimentally if they had actually forgotten. Furthermore, in those studies (e.g., Shor, 1959) in which subjects were asked to simulate other hypnotic phenomena—for example, hypnotic analgesia—those simulators who stated that they had actually experienced that which they were supposed to simulate were deliberately excluded from the analysis of the data and were not mentioned in the discussion of results.

Further Considerations

Several additional findings require emphasis:

The correlations presented in Table 7 indicate that those hypnotic subjects who are the most responsive to test suggestions of arm levitation, body immobility, and the other test suggestions included in the BSS also tend to be the most responsive to peremptory or permissive suggestions of amnesia. However, hypnotic subjects who have been asked to simulate amnesia perform their role satisfactorily (i.e., manifest amnesic behavior)

TABLE 7

CORRELATIONS FOR HYPNOTIC SUBJECTS BETWEEN SCORES ON ABBREVIATED BARBER SUGGESTIBILITY SCALE (BSS) AND EXPERIMENTAL RECALL AND BETWEEN BSS AND SUBJECTIVE SCORES

	BSS-experimental recall	BSS-subjective scores
Authoritative suggestions of amnesia (Groups 1 and 9)	-.60*	+.48*
Permissive suggestions of amnesia (Groups 2 and 10)	-.34	+.36
Instructions to simulate amnesia (Groups 3 and 11)	+.21	+.20
No suggestions of amnesia (Groups 4 and 12)	-.02	+.09

* $p < .05$.

regardless of whether or not they are responsive to suggestions of arm levitation, body immobility, and so on.

If a recorded-written presentation had not been used in the present experiment, one could argue that the results might be due to bias on the part of the experimenter. That is, it might have been argued that the experimenter consciously or unconsciously desired and expected more amnesic responses from some groups than from others and that his desires and expectations, by affecting the manner and the tone in which he administered the suggestions and assessed the amnesia, influenced the experimental results (Barber & Calverley, 1964b). However, by using a recorded-written presentation with half of the subjects, this argument becomes invalid. Subjects given the suggestions by means of a tape recording and the tests for amnesia by means of a written questionnaire gave essentially the same results as those given the suggestions and tests for amnesia orally.

Williamsen et al. (1965) implied that the presence or absence of "hypnotic trance induction" was an important variable in producing the differences in performance among hypnotic, simulating, and control groups. Although our findings with Groups 1, 7, and 8 unequivocally confirmed their results, the findings obtained with the additional groups participating in our experiment controvert their implied conclusion, as follows: (a) *In most instances, "hypnotic trance induction" does not significantly affect performance.* Hypnotic and waking subjects told peremp-

torily, "You will not remember," did not differ on the tests for amnesia. Hypnotic and waking subjects instructed to simulate amnesia also did not differ in performance. Furthermore, hypnotic and waking controls performed similarly on the tests. (b) *When "hypnotic trance induction" affects performance, it may produce less amnesia than would be found without it.* When hypnotic and waking subjects were told, "Try to forget," the hypnotic subjects showed less amnesia than the waking subjects. (c) *The important factors in producing differences in performance on tests for amnesia are whether or not suggestions of amnesia are administered and the types of suggestions administered.* Irrespective of the presence or absence of "hypnotic trance induction," subjects differed on the tests for amnesia depending on whether they were given suggestions to simulate, authoritative or permissive, or no suggestions of amnesia.⁸

Denotations of the Term "Amnesia"

The global construct "amnesia" has been used to conceptualize behaviors exhibited in the present experiment. To understand the import of the findings it is necessary to specify what this construct denotes. The data summarized below suggest that the "amnesia" exhibited in the experiment may have consisted primarily of unwillingness to verbalize the critical words rather than "actual forgetting" of the words.

When told "the experiment is over," the "amnesic" subjects in *all* groups readily verbalized, that is, easily remembered, the critical words.

⁸ Two additional points can be noted parenthetically: (a) It appears that amnesia can be produced as easily by suggestions given to subjects who are compelled to participate in the experiment as in those who volunteer. We used "captive" females of ages 17-25 whereas Williamsen et al. worked with females of similar ages who volunteered for hypnosis. As pointed out above, the three experimental groups in the Williamsen et al. study and our three similarly treated groups (Groups 1, 7, and 8) responded in essentially the same way to the tests for amnesia. (b) It also appears that simulators will fulfill their role-assignment satisfactorily regardless of whether the same experimenter (as in the present study) or different experimenters (as in the Williamsen et al. study) are used to instruct them and to assess their performance (cf., Orne, 1959).

The "amnesic" subjects in the hypnotic and waking groups that had received authoritative or permissive suggestions showed little if any evidence of amnesia when they were tested indirectly by means of the recognition tests.

The "amnesic" subjects in all groups *recognized more critical words than neutral (control) words* when they were presented as partial words. This outcome appears to indicate that the ostensibly "amnesic" subjects in all groups were quite "aware" of the critical words and had not "actually forgotten" them.

The overwhelming majority of "amnesic" subjects testified "post"-experimentally that they "forgot" only "partially" in that they "thought of the critical words at certain times, off and on, during the experiment" (see Table 6).

Very few "amnesic" subjects testified "post"-experimentally that they "forgot completely" in that they "did not think about the critical words at all during the experiment and the words did not enter their mind" (see Table 6). It may be that these few subjects did not "think about the critical words at all." On the other hand, these subjects may have stated that they "did not think about the words" in order to please the experimenter or to try to do what they thought was expected of them. The latter possibility appears more likely in that, during the experiment, the subjects had verbalized ("thought about") most of the critical words when they were presented as partial words or as whole words and, more important, they recognized and verbalized more of the *critical* words than of the neutral (control) words.

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